NASA SBIR/STTR Technologies

H1.01-9274 - Dust Separation and Measurement System for Mars ISRU Applications

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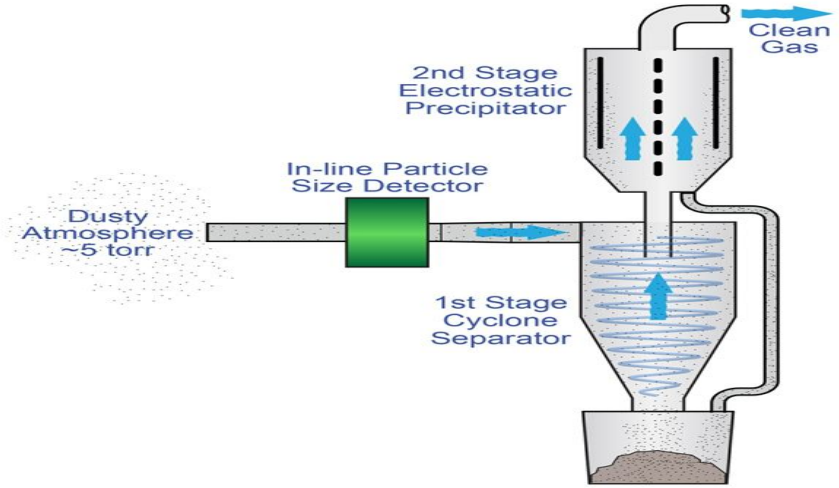
Identification and Significance of Innovation

Dust is entrained in the Martian atmosphere and needs to be removed for atmospheric gas processing.

The dust particle size and atmospheric content is only sparsely known.

Creare proposes to develop a compact, integrated dust separation and measurement system for Mars ISRU applications

The Creare two-stage separator combines inertial and electrostatic precipitators with a novel particle size sensor.



Estimated TRL at beginning and end of contract: (Begin: 2 End: 4)

Technical Objectives and Work Plan

Technical Objectives:
* Define the required performance specifications for the ISRU dust separation and measurement system (DSMS).

* Develop detailed two-phase flow model for a two-stage dust separator.

* Determine the performance of the dust separator and measurement system through model validation tests.

* Perform detailed design of prototype DSMS.

Work Plan:
Task 1. Determine Design Specifications
Task 2. Develop Two-Stage Dust Separation System Model
Task 3. Particle Measurement Sensor Design
Task 4. Prototype Fabrication and Testing
Task 5. Manage and Report

NASA Applications

ISRU plants for the production of oxygen, and other consumables from dusty atmospheric gas for fuel and/or life support on the Mars sample return mission and manned missions to Mars.

Dusty atmosphere gas processing on other planetary missions.

Non-NASA Applications

Improvement of the energy efficiency and separation efficacy of inertial and electrostatic precipitators in industrial processes such as waste incinerators as well as air filters for internal combustion vehicles and power plants.

Firm Contacts

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